

“A New Form of Self-restoring Coherer.” By Sir OLIVER LODGE, F.R.S. Communicated verbally March 5,—Received in Manuscript March 18, 1903.

On the general subject of the detection of Hertzian waves the writer took the opportunity of the discussion on Dr. Fleming's paper (p. 398), to describe briefly the latest form of coherer, which Dr. Muirhead and he had brought out and always now employed in connection with space telegraphy, and which their assistant Mr. E. E. Robinson had helped to work out. It might be described as a development of the mercury form of coherer described some years ago by Lord Rayleigh, and again in a modified fashion by Mr. Rollo Appleyard. In Lord Rayleigh's form this consisted of a pool of mercury cut across with a paraffined knife, and the two half pools connected to a battery and key. As soon as the key was depressed so as to throw a few volts on to the intervening film of oil, the electrostatic pressure seemed to squeeze the oil out, and the pools of mercury became one.

Needle points dipping in oil and mercury were tried as practical coherers, the points being pulled out electromagnetically every time a signal arrived. Rotating forms of contact for automatic decoherence were also tried in various forms, and ultimately the method took the form of a rotating sharp-edged steel wheel, about half an inch in diameter, constantly touching a pool or column of mercury on which was a thin layer of oil. No effective contact occurs between the wheel and the mercury, notwithstanding the immersion, because of the film of oil; but the slightest difference of potential applied to the two, even less than one volt, is sufficient to break the film down and complete a circuit, which, however, the rotation of the wheel instantaneously breaks again. The spark is so sudden that for its purposes the wheel is for the instant virtually stationary, and yet the decohesion is so rapid that signals can be received in very rapid succession. The definiteness of the surfaces and of the intervening layer make the instrument remarkably trustworthy, and the thinness of the insulating film makes it very sensitive. In fact a single cell of a battery cannot be employed as a detector, because it is of too high a voltage for the film to stand. A fraction of a volt is employed by a potentiometer device—usually something like one-tenth of a volt—and it is adjusted to suit circumstances. The battery acts through the coherer direct on a low resistance recorder, and the record on the strip shows every character of the arriving pulses, and exhibits any defect in the signalling. Provided that every joint and contact, except the one intended to be filmed, is thoroughly good, the coherer in this form is so definite and satisfactory that it becomes safe to say that the only outstanding defects are those which occur at the sending end. The signals are

picked up and recorded precisely as they are emitted, as has been tested by intercalating a siphon recorder in a much diluted tapping circuit at the sending end, so as to get a record with which to make comparison. The traces obtained at the two ends are identical to a surprising degree.

The mercury level has an adjustment which is easily made. One precaution is to keep the rim of the wheel clear of dust, which is done by a cork or leather pad pressed lightly against it by a spring.

The instrument is not at all sensitive to tremor, and requires no particular delicacy of adjustment. The wheel has to be positive, the mercury negative.

A telephone in circuit, through a transformer or otherwise, affords an easy method of discriminating the signals by ear. The speed of the wheel gives another convenient adjustment to suit various circumstances.

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“On Central American Earthquakes, particularly the Earthquake of 1838.” By Admiral Sir JOHN DALRYMPLE HAY, Bart., G.C.B., F.R.S. Received March 6,—Read March 19, 1903.

The very interesting report of Dr. Tempest Anderson and Dr. J. S. Flett on “Recent Volcanic Eruptions in the West Indies,” induces me to suggest that inquiries should be made in Colombia and in Central America as to disturbances in those regions, in order to trace the connection existing between the earthquakes and volcanic eruptions which are there so prevalent, and those in the West Indies.

Doubtless Mr. Welby, who has just returned to his post at Sta. Fé de Bogotá, might be able to obtain thence some information on this matter.

In the British Association Report, of 1858, upon Earthquakes, those of 1835 and of 1841 are given; but, unfortunately, no information is given as to the effect of those disturbances from any British source.

The British Association in both cases seem to have been mainly indebted for their information to the Académie, and hence the effects in Martinique and Guadeloupe are quoted, but nothing is reported from our West India Islands.

One of the most terrible disturbances in its effects, that of 1838, is not even alluded to. The only record of it is in the work of E. G. Squier, late *Chargé d’Affaires* from the U.S. of America to the Republics of Central America (2 vols., Appleton, New York, 1852), who was commissioned by his Government to report upon that region in reference to the Nicaraguan Canal. Vol. 1 has the map; vol. 2, pp. 114, 115, and p. 162 alludes to the eruptions of Cosequina in 1838,